

Devils Postpile National Monument

National Park Service
U.S. Department of the Interior

Devils Postpile National Monument,
California



Fire and Fuels Management Plan

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1. INTRODUCTION

Need for this Plan

Wildland fire has long been recognized as one of the most significant natural processes operating within and shaping Sierra Nevada ecosystems. Virtually all vegetation communities show evidence of fire dependence or tolerance. At the same time wildland fire has the potential to threaten human lives and property. Consequently there is a need to manage wildland fire so that threats to humans and property are reduced, while at the same time restoring and/or maintaining its function as a natural process.

This *Fire and Fuels Management Plan* (FFMP) provides long- term direction for achieving goals related to human safety and ecosystem management. The program described in this plan was developed following guidelines and requirements of the National Environmental Policy Act and National Historic Preservation Act. A companion *Environmental Assessment* (EA) provides details on the alternatives considered, and assesses the impacts associated with the actions described in this document. This plan also satisfies the requirements and direction provided in policy and legislative authority.

Planning and Consultation

Fire management and resources specialists from Sequoia and Kings Canyon National Parks collaborated with the superintendent of Devils Postpile National Monument, fire managers from the Inyo National Forest, and local communities to develop this plan.

Legislative Authority

Authority for carrying out a fire and fuels management program originates with the Organic Act of the National Park System, August 25, 1916. This Act states that the primary goal of the National Park Service is to preserve and protect the natural and cultural resources found on lands under its management in such manner as will leave them unimpaired for future generations. Additional authorities for fire management activities include: 31 U.S. Code 665 (E) (1) (B) which provides the authority to exceed appropriations due to wildland fire management activities; Section 302 (c) (2) of the Federal Property Administration Services Act of 1949, as amended; and Chapter VIII of the 1983 Supplemental Appropriations Act (P.L. 97- 257) which deals with contracting for fire protection; and The Reciprocal Fire Protection Act of May 27, 1955 (42 U.S.C. 1856) that authorizes reciprocal agreements with federal, state, and other wildland fire protection organizations.

2. RELATIONSHIP TO PLANNING AND POLICY

Interagency Policy

This *Fire and Fuels Management Plan* supports the National Fire Plan which is based on two documents written by the interagency fire community: *Managing the Impact of Wildfires on Communities and the Environment, A Report to the President in Response to the Wildfires of 2000* and *A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: a 10- Year Comprehensive Strategy*.

Department Of Interior Policy

Department of the Interior Departmental Manual, DM 910 (USDI 1997) sets policy and priorities related to wildland fires occurring on any DOI lands:

"Wildland fires, whether on lands administered by the Department or adjacent thereto, which threaten life, man- made structures, or are determined to be a threat to the natural resources or the facilities under the Department's jurisdiction, will be considered emergencies and their suppression given priority over normal Departmental programs. Bureaus will give the highest priority to preventing the disaster fire - the situation in which a wildfire causes damage of such magnitude as to impact management objectives and/or socio- economic conditions of an area. However, no wildland fire situation, with the possible exception of threat to human survival, requires the exposure of firefighters to life threatening situations."

The Department Manual also identifies the need for fire management plans to guide resource management objectives and to provide consistency in managing prescribed fire.

"Prescribed fires...may be used to achieve agency land or resource management objectives as defined in the fire management plans. Prescribed fires will be conducted only when the following conditions are met: a) conducted by qualified personnel under written prescriptions and b) monitored to ensure they remain within prescription. Prescribed fires that exceed the limits of an approved prescribed fire plan will be reclassified as a wildland fire. Once classified as a wildland fire, the fire will be suppressed and will not be returned to prescribed fire status."

In summary, the Departmental Manual provides guidance for the prevention, pre- suppression, control and management of fire on lands or threatening lands under the jurisdiction of the DOI.

National Park Service Policy

NPS Management Policies (2001, 4.1.5, 30) summarizes the intent to allow natural processes to predominate in parks:

"The service will re- establish natural functions and processes in human disturbed natural systems in parks unless otherwise directed by Congress. Landscapes disturbed by natural phenomena, such as landslides, earthquakes, floods, hurricanes, tornadoes and fires, will be allowed to recover naturally

unless manipulation is necessary to protect park developments or visitor safety. Impacts to natural systems resulting from human disturbance include. . . and the disruption of natural processes. The Service will seek to return human- disturbed areas to the natural conditions and processes characteristic of the ecological zone in which the damaged resources are situated. The Service will use the best available technology, within available resources, to restore the biological and physical components of these systems, accelerating both their recovery and the recovery of landscape and biological- community structure and function."

NPS Management Policies (2001, 4.5, 38) states the need for effective fire management planning to maintain the natural role of fire in parks:

"Wildland fire may contribute to or hinder the achievement of park resource objectives. Therefore, park fire management programs will be designed to meet park resource management objectives while ensuring that firefighter and public safety are not compromised. All fires burning in natural or landscaped vegetation in parks will be classified as either wildland fires or prescribed fires. All wildland fires will be effectively managed through application of the appropriate strategic and tactical management options. These options will be selected after comprehensive consideration of the resource values to be protected, firefighter and public safety, and costs. Prescribed fires are those fires ignited by park managers to achieve resource management and fuel treatment objectives. Prescribed fire activities will include monitoring programs that record fire behavior, smoke behavior, fire decisions, and fire effects to provide information on whether specific objectives are met. All parks will use a systematic decision- making process to determine the most appropriate management strategies for all unplanned ignitions, and for any prescribed fires that are no longer meeting resources management objectives."

NPS Management Policies (2001) further states that without an approved fire management plan, parks must immediately suppress all wildland fires, taking into consideration park resources and values, firefighter and public safety, and costs.

National Park Service policy, articulated in *Directors Order 18 - Wildland Fire Management* (1998) and *Reference Manual- 18* (1998), require that all parks with vegetation capable of supporting fire develop a fire management plan. This FFMP follows the outline provided by *Reference Manual 18* except that it does not address wildland fire use because all unplanned ignitions within the monument will be suppressed.

Policy also directs the monument to work cooperatively with their adjacent land management and fire management agencies to implement mutually beneficial projects and programs. This plan provides guidance not only for monument staff, but also their neighbors. With clearly stated program goals and objectives, the parks' neighbors will be better able to comment on planning efforts and provide technical assistance.

All of the above directives and policies are incorporated into this *Fire and Fuels Management Plan*.

Establishment and Purpose of Devils Postpile

Devils Postpile National Monument was established by Presidential Proclamation in 1911 to preserve "the natural formations known as the Devils Postpile and Rainbow Falls" for their

scientific interest and for public inspiration and interpretation. Devils Postpile is a dramatic mass of columnar-jointed basalt, the remnants of lava that flowed down the valley of the Middle Fork of the San Joaquin River about 100,000 years ago. Rainbow Falls is a spectacular 101-foot high waterfall on the Middle Fork San Joaquin River.

The mission of Devils Postpile National Monument is to preserve the natural formations known as the Devils Postpile and Rainbow Falls. The mission is evolving to involve ecosystem values of watersheds, biological diversity, sustainable use, and connecting people to parks.

The *Devils Postpile National Monument Strategic Plan* (2000), details the monument's mission and long-term goals with respect to natural resources. It states that: "Natural and cultural resources and associated values are protected, restored and maintained in good condition and managed within their broader ecosystem and cultural context."

This *Fire and Fuels Management Plan* is an operational guide for managing both the monument's wildland fire and fuels treatment programs. The plan implements the goals and objectives outlined in the monument's management plans and details both wildland fire suppression and fuels treatment activities in the monument.

3. WILDLAND FIRE MANAGEMENT STRATEGIES

General Management Considerations

The fire and fuels management program at Devils Postpile National Monument seeks to benefit monument resources and society by restoring and maintaining the natural fire regime in a manner consistent with firefighter and public safety. All fire management actions taken within the monument will give strong consideration to preserving wilderness characteristics, or minimizing the impact from humans on the landscape given the amount of wilderness inside and surrounding the monument.

All wildland fires will be suppressed using appropriate management strategies. Minimum impact suppression techniques will be applied to stop unplanned ignitions and fires burning into the monument from the Inyo National Forest. The monument relies upon interagency cooperation from the Inyo National Forest for initial attack operations on unplanned ignitions.

Fuels treatment will include the use of mechanical tools such as thinning and piling of vegetation to achieve fuels clearance surrounding structures, coupled with burning or chipping of piled material. Prescribed fire may be used to reduce hazardous fuels and/or restore ecosystem health. Fuels treatments will be managed by Sequoia and Kings Canyon National Parks staff working with Inyo National Forest personnel.

Goals

The following goals were developed from the monument's mission statement and National Park Service policy.

1. *Protect and, where applicable, restore the monument's natural, cultural, and social resources.*

Natural resources include the Devils Postpile and Rainbow Falls as well as the ecological values of vegetation, water, wildlife, natural processes, and air resources. Cultural resource values include prehistoric and historic cultural sites, historic structures, and contemporary structures, both government- owned and private. Social values include park employees, visitors, neighboring communities, and wilderness.

2. *Reduce fire hazards in monument ecosystems.*

Fire hazard is defined as those attributes that affect the ability to control fires, or contribute to extreme fire behavior. Certain elements that contribute to hazardous fire conditions, such as steep slopes and the amount of solar radiation that heats fuels and dries vegetation, cannot be changed by management actions. Fuel conditions, however, can be effectively altered by management actions and are the focus of most hazard fuel reduction activities.

3. *Reduce risk of unwanted wildland fire.*

Risk is defined as the probability of new fire starts, whether by human or natural ignitions (lightning). Since lightning ignition risk is outside the realm of management control, the focus of the risk portion of the fire management program is to reduce the probability of unwanted human ignitions.

Objectives

To focus planning and operations, the monument has developed four program objectives that begin to specify the major tasks facing the fire and fuels management staff. Consistent attention to these objectives will achieve the three broad program goals and contribute to national and regional fire policy and strategies.

- 1) Manage all unplanned wildland fires appropriately – Manage all wildland fires, regardless of ignition source or the location of ignition, using strategies and tactics commensurate with protection of human health, safety, and natural and cultural resource values, as described in this approved *Fire and Fuels Management Plan*. Maintain existing cooperative agreements with the Inyo National Forest in order to facilitate close working relationships and mutual cooperation regarding fire management activities.
- 2) Plan and implement appropriate treatments to reduce the threat to values from unwanted wildland fire and to restore or maintain ecological values – Annually analyze fire hazards, values, and risks so that projects are designed within the Fire Management Unit (FMU). Using GIS to plan treatments, ecological, life/safety, infrastructure, and cultural resource values will be analyzed and updated yearly through feedback from monitoring and research advances. Consider and mitigate during the planning phase any negative impacts to cultural and natural resources that might result from management operations.
- 3) Understand the consequences of fire management actions – Monitor and evaluate the effects of fire and fuels management activities on monument natural and cultural resources with particular attention to vegetation, water, wildlife, air, and cultural resources. Evaluate monitoring information to refine the management activities and objectives, and prescription range values as appropriate. For vegetation, utilize ecosystem “restoration” and “maintenance” target conditions developed as one benchmark of program success. Work to ensure that particulates produced by prescribed fire projects remain within all federal, state, and local air resource objectives by monitoring smoke in cooperation with the San Joaquin Valley Unified Air Pollution Control District. Identify issues or missing information needs that, once known, will lead to more effective implementation of the parks’ fire and fuels management program. Conduct research as issues or information gaps are identified through monitoring and evaluation of fire management activities. Understand public attitudes and political concerns through personal contacts, social science research, and other avenues. Incorporate this information into management decisions as appropriate.

- 4) Provide current and accurate information on wildland fire and fuels management activities to the public, the NPS workforce, and cooperating agencies – Provide interpretive and educational programs designed to enhance public and staff understanding and awareness of fire ecology and wildland fire management.

Fire Management Options

Managers have a variety of options for responding to wildland fire and lessening the threat to values from wildland fire. In Devils Postpile these include: wildland fire suppression, prescribed fire, and mechanical fuel reduction. These three options, described below, will be used in conjunction with preparedness activities, public information and education, monitoring, and research which are discussed later in this document (Chapters 4, 6, 7, and 9).

Wildland fire suppression is the management of unplanned wildland fires, including human and lightning ignited fires, to minimize detrimental resource impacts from such fires. Suppression fires will receive appropriate management responses that give consideration to monument and nearby resource values, hazards, and risks.

Prescribed fires are ignited by management to achieve resource objectives, most often a combination of ecosystem restoration or maintenance objectives and reduction of high hazard fuel loadings. These objectives are not mutually exclusive and usually all prescribed fire operations contain a mix of them.

Mechanical fuel reduction is the use of mechanical equipment (i.e. weed whackers, chainsaws, dozers, rubber tired skidders, chippers, etc.) to cut and remove, or prepare for burning, woody fuels. Mechanical treatments are used around developments. Mechanical treatments are intended to help in achieving resource management objectives, most often a combination of ecosystem restoration and reduction of high hazard fuel loading objectives, in the vicinity of monument structures.

Table 3-1 – Goals, Objectives, and Fire Management Options

Fire Management Goals	Program Objectives	Options						
		Wildland Fire Suppression	Preparedness Activities	Mechanical Fuel Reduction	Prescribed Fire	Monitoring and Evaluation	Research	Public Information and Education
<p>Protect and restore the parks' ecological, cultural, and social values. Ecological values include vegetation, water, wildlife, natural processes, and air resources. Cultural values include prehistoric and historic cultural sites, historic structures, and contemporary structures, both government-owned and private. Social values include park employees, visitors, neighboring communities, and wilderness.</p> <p>Reduce fire hazards in park ecosystems. Fire hazard is defined as those attributes that affect the ability to control fires, or contribute to extreme fire behavior. Fuel conditions can be effectively altered by management actions and are the focus of most fuel hazard reduction activities.</p> <p>Reduce risk of unwanted wildland fire. Risk is defined as the probability of new fire starts, whether by human or natural ignitions (lightning). The focus of the risk portion of the fire program is to reduce the probability of unwanted human ignitions.</p>	1. Manage all unplanned wildland fires appropriately.	X	X					
	2. Plan and implement appropriate treatments to reduce the threat to values from unwanted wildland fire and restore or maintain ecological values.		X	X	X		X	
	3. Understand the consequences of fire management actions.					X	X	X
	4. Provide current and accurate information on wildland fire and fuels management activities to the public, the NPS workforce, and cooperating agencies.		X			X		

Figure 3-2 – Map of Devils Postpile Fire Management Unit (FMU) with wilderness boundaries

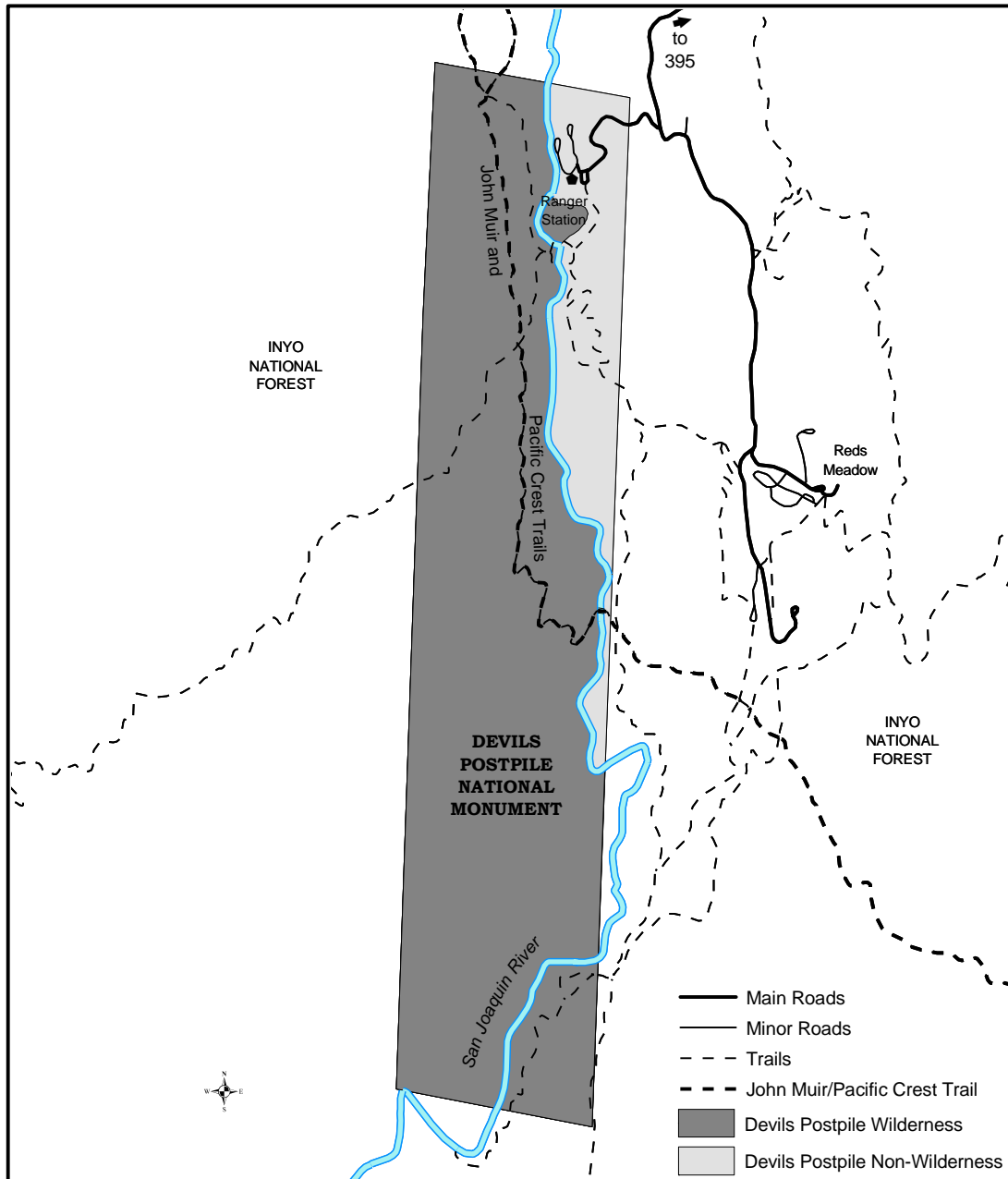
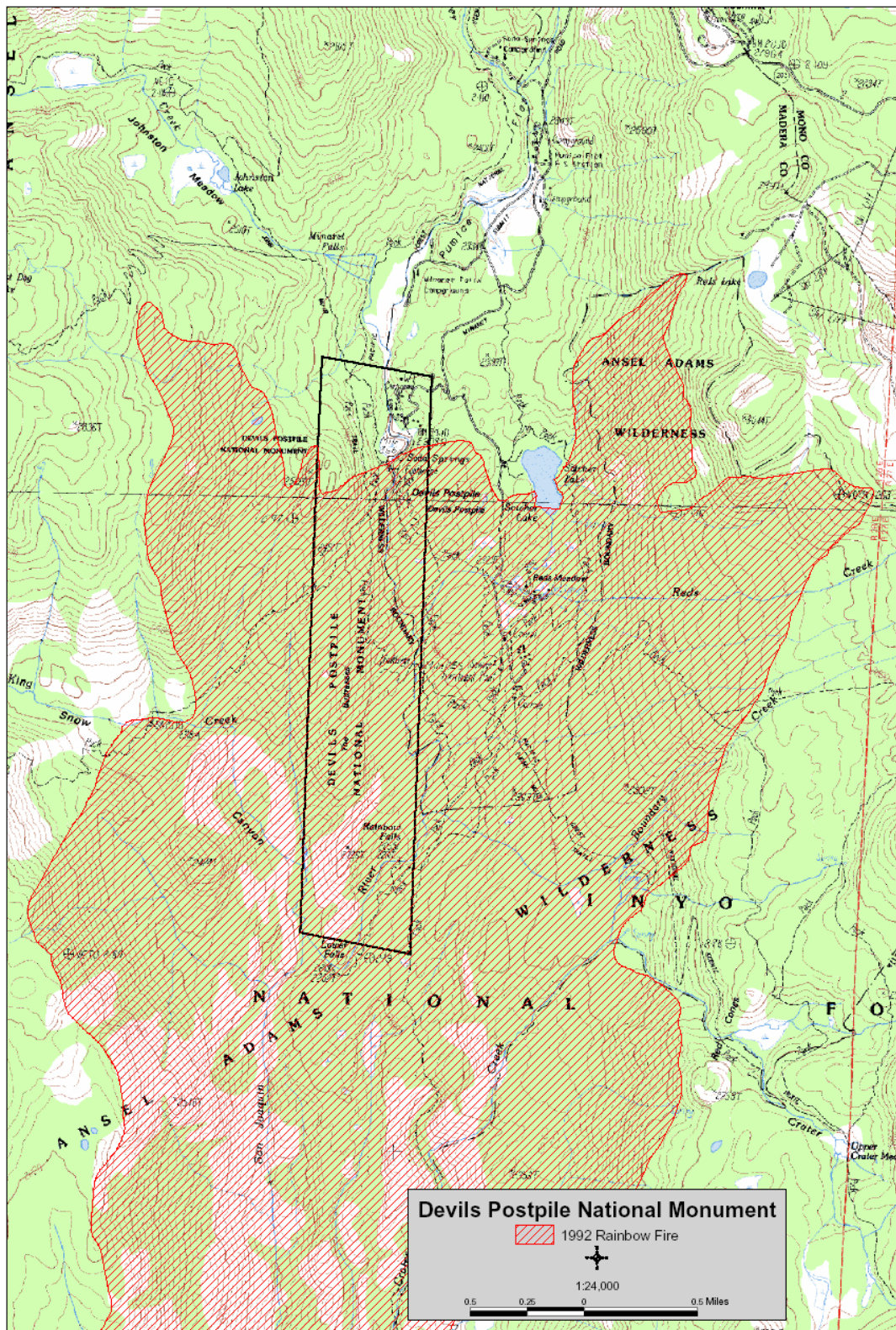


Figure 3-3 – Rainbow Fire Perimeter (1992)



Description of Fire Management Unit

Identification of Fire Management Units (FMUs) is the cornerstone for managing the wildland fire program. The monument will be managed as a single FMU (see Figure 3- 2) which is described below.

Table 3-4 – Description of Fire Management Unit (FMU)

DEPO FMU	
Size and Range	
Total	800 acres
Wilderness	747 acres (90% of the monument)
Elevation range	approximately 7,150 to 8,320 feet
Climate	
<p>The climate of the area varies greatly with the seasons. Winters are generally severe while summers are moderate. The nearby community of Mammoth Lakes exhibits daily average high temperatures of 37°F in January and 79°F in July. Annual precipitation at Mammoth Lakes is 23 inches, most of which falls as snow in December and January. Snow accumulation in the monument in most years is substantial. Summer months are mainly dry, with thunderstorms at times in late summer and fall.</p>	
Geology and Hydrology	
<p>The geologic history of the area is complex. Major land-forming processes displayed in the monument include faulting and earthquakes, volcanism, and glaciation. The Middle Fork of the San Joaquin River is another major force in sculpting the land. The river passes through the length of the monument and varies greatly in character as it flows through a wide range of terrain and geologic features. Flows in the river fluctuate significantly throughout the year, with major flows during spring snowmelt and significantly reduced flows later in the summer and early fall.</p>	
Vegetation	
<p>Though small in size, the monument is diverse enough in its topography and geology to support a number of different plant communities. Species characteristic of both the wetter western and drier eastern slopes are present in the monument because of its proximity to the Sierra Crest. The dominant mixed coniferous forest gives way to a riparian zone along the river, and in other places to small meadows, seeps and sag ponds. As elsewhere in the Sierra Nevada, fire has played an integral role in the development and maintenance of most vegetation communities. Mid-elevation coniferous forests on the west slope of the range have been subject to frequent lightning-ignited fires. Pre-Euroamerican fire frequency was related to elevation, aspect and vegetation type with frequent fires (6-17 yrs) in lower mixed-conifer forests declining with increasing elevation (Caprio & Swetnam 1995, Swetnam et al. 1998, Caprio 2004).</p>	
Air Quality	
<p>The monument's location in Madera County makes it part of California's San Joaquin Valley Unified Air Pollution Control District (hereafter referred to as the Air District). The Air District is in non-attainment status for PM10, severe non-attainment for ozone (8hr), and extreme non-attainment for ozone (1hr).</p>	

DEPO FMU

Rainbow Fire

The 1992 Rainbow Fire burned 85% of the monument's land following an extended 80-plus-year period of fire suppression. Effects of this fire will persist and have long-term ramifications on the vegetation in the monument. Tree mortality in the southeast and western portions of the monument was nearly 100%. A shrub and herb dominated landscape has replaced forest vegetation. This vegetation differs in relative composition and structure from that which occurred before the burn. These changes are believed to be outside of the normal range of variability that would have occurred in the area prior to the extended period of fire suppression. Of course, some past fires would have been hot, but in concentrated areas, not to the spatial extent of the Rainbow Fire. Additional fires in the Rainbow Fire area would likely kill most of the limited tree regeneration and tend to perpetuate unnatural conditions.

Wilderness Resources

Approximately 90 percent (747 acres) of the monument and most of the National Forest land adjacent to the monument is designated wilderness. Wilderness plays a role in the overall health of ecosystems, by providing natural areas without roads or human residents, and valuable habitat for wildlife and plants. It is characterized by its outstanding opportunities for solitude, where people are visitors who do not remain.

Cultural Resources

Evidence has been found in the monument of prehistoric uses of the area, with seven prehistoric sites inventoried based on the presence of tools, points, and chips. It is considered likely that the Postpile was the locale for seasonal hunting and fishing camps used by Northern Paiute and/or Northfork Mono groups. However, the archeological sites are modest in size and materials and analyses conducted thus far have not provided the basis for definitive conclusions about the peoples using the area and the nature of the uses.

Historic uses of the area date from the 19th century. A toll road known as the French Trail, developed in 1879-80 to connect the mining enterprises at Mammoth to the east with the Central Valley to the west, passed through Reds Meadow, crossed the river and then continued up King Creek. Miners are also thought to have maintained camps in the area at this time and worked nearby mines. Some evidence also suggests the location of late 19th century summer shepherd camps within the monument, and the remnants of "Postpile Joe's" trapper cabin dating from the early decades of the twentieth century can still be seen.

The state of knowledge regarding cultural resources in the monument is fairly good. An archeological survey of all surveyable land within the 800 acres of the monument was conducted in 1992, following the Rainbow Fire. The survey report did indicate the need for additional analysis of the available site information to more clearly identify periods and types of use and ethnography. All existing structures in the monument, including the rustic ranger station, have been evaluated for historic significance and found not eligible for the National Register.

Land Use and Infrastructure

Most of the monument is undeveloped except for trails. An area of about 5 acres at the north end contains visitor service and administrative facilities. There are no inholdings or rights-of-way in the monument.

Lands in the monument west of the Middle Fork of the San Joaquin River are part of the Ansel Adams Wilderness, a unit of the National Wilderness Preservation System. Management policies for wilderness areas are aimed at minimizing human intrusions. The use of mechanized equipment in such areas is extremely limited, and improvements are limited to those essential for access and use. Visitor use levels are controlled as needed to maintain pristine conditions.

The Pacific Crest National Scenic Trail, a unit of the National Trails System extending from Mexico to Canada, passes through the monument. The Pacific Crest Trail is managed on a cooperative basis by the agencies whose lands are crossed. The Forest Service has overall responsibility for coordination on this trail.

DEPO FMU

The Middle Fork of the San Joaquin River through the monument is a state-designated Wild Trout water. As such, the state does not stock this reach of the stream with hatchery fish.

Cooperators and Neighbors

The monument is surrounded on all sides by Inyo National Forest. Forest land west of the river is managed as wilderness with the same basic objectives as the monument. Forest lands east of the river are managed primarily for recreation, with several camp areas and other recreation sites in close proximity to the monument.

The Town of Mammoth Lakes, long a resort center offering winter accommodations for visitors to the nearby ski area, has in recent years grown rapidly as a year-around resort destination, with the monument a prominent attraction for summer visitors. Further expansion of tourist facilities at Mammoth Lakes can be expected to lead to increased visitation at the monument.

Reds Meadow Resort and Pack Station is also located nearby and provides organized pack trips in the nearby mountains. A café, store, and limited overnight accommodations are provided at the resort, in addition to extensive stock handling facilities.

Access

The monument and several Forest Service recreation sites occupy a narrow valley accessible to motor vehicles only by a single steep and narrow road descending from the east. This road is closed to most private vehicle use during the summer season from 7:30 AM until 5:30 PM. A shuttle bus originating at the Mammoth Mountain Ski Area, 10 miles away, provides access to the monument, Forest Service sites, and Reds Meadow during this period.

Fire Regime

Fire history studies, based on tree-ring studies of fire-scarred trees in the Sierra Nevada, show that most vegetation communities existed with some influence from fire. Fire occurrence may have been frequent with regular occurrence (every 3-5 years) or rare and episodic. However, since the late 19th century a policy to suppress all fires has met with a fair degree of success. Consequently, species that require fire for survival or to regenerate and vegetation communities that developed in the presence of fire have experienced an unprecedented period without fire (Caprio and Graber, 2000). This change in the fire regime has resulted in important and often quite drastic ecosystem changes. In mixed-conifer forests, stands have become denser in many areas, with increased dominance of shade-tolerant species. Shrubs and herbaceous plants are probably less abundant than in the past (Kilgore and Biswell 1971, Harvey et al. 1980). Perhaps most importantly, dead material has accumulated, causing an unprecedented buildup of surface fuels (Agee et al. 1978, van Wagtendonk 1985). Additionally, "ladder fuels" capable of conducting fire into the crowns of mature trees have increased (Kilgore and Sando 1975, Parsons and DeBenedetti 1979). One of the most immediate consequences of these changes is an increased hazard of wildfires sweeping through the mixed conifer forests with a severity that was rarely encountered in pre-Euroamerican times (Kilgore and Sando 1975, Stephens 1995, 1998).

On the dry east slope of the Sierra Nevada, east of Devils Postpile, Stephens (2001) found mean fire return intervals of 9 years and 24.7 years respectively at two adjacent sites in Jeffrey pine and upper montane forest. Preliminary data from a fire history study within the monument (Caprio 2004, Caprio unpublished data) indicate that lower elevation areas of mixed-conifer (dominated by Jeffrey pine, red and white fir) experienced repeated fires each century (fire intervals ranged from seven to 33 years). Higher elevation and more northern areas of the monument experienced fire less frequently or very rarely (forests dominated by lodgepole pine, red fir, western white pine with mountain hemlock in areas with very rare fire occurrence). This variation appears to be the result of topographic barriers to fire spread up the San Joaquin River drainage and changes in vegetation and fuel with elevation.

DEPO FMU

Historical Weather Analysis

The monument has a Mediterranean climate with respect to the fact that 95% of the precipitation falls between the fall and spring months, (October to May). The weather throughout the summer and fall months is generally hot and dry, but subject to readily identifiable frontal passages during the early and later parts of summer. These frontal passages are generally non-existent during the main summer months of June through August. Thunderstorms and lightning are common during the main part of summer, July and August. Thunderstorms and lightning may occur before July and after August, but fuel moisture is normally sufficient to prevent significant fire danger or fire behavior problems. Marine air occasionally moves into the forest from the west (out of the San Joaquin Valley), dropping temperatures, raising relative humidity, and generally reducing fire danger and fire behavior for short periods without any long-term effects. Such intrusions are relatively infrequent, and cannot be counted on for reducing fire potential.

During the fall and winter months the monument experiences foehn winds (called locally mono winds), which are winds of compressed heating from the north, but some times from the northeast or even east. Ignitions occurring on the monument during these wind events have the potential for extreme fire behavior. The monument generally receives winter-like storms beginning in October or November that reduce or eliminate fire danger until late spring or early summer. The main fire problems occur between the transition months of late spring to early summer and from late summer to early fall. Early summer problems can have thunderstorms with dry lightning and little precipitation. The late summer and early fall months can have fire problems with strong foehn winds with low humidity.

Fire Season

The fire season on the east side of the Sierra crest has an unusual pattern. The Eastern Sierra has a seasonal wind phenomenon beginning in late winter and lasting through the spring. Since green-up hasn't yet occurred, these winds result in a significant number of large, early-season fires. Although about 90 percent of the fire starts typically occur between mid-May and early-October, significant acreage is often burned in the February through June period.

In general, on the northern and higher elevations of the Inyo National Forest inclusive of the monument, the burn window is in the spring from April through June and then in the fall from mid-September until early December and occasionally into January. There can be a substantial overlap of "fire" and "burning" seasons in both spring and fall. Often the fall window can have a very short duration. It is not unusual for weather and fuel conditions to change from "too hot" for prescribed burns to "too cool" in a matter of hours.

Current research on differential flora and fauna responses to the season of burning is being done in Sequoia National Park and across the nation. As results from these initiatives become available, the knowledge generated will be used to improve the fire management program.

Fuel Characteristics

The monument's fuel types are best represented by either closed-canopy timber or wetter brush models. Fuel models 8, 10, and 5 are indicative of fire behavior modeling. Areas not burned in the Rainbow Fire are represented by the timber models. While some pine component is present west of and near the river, it is not enough to warrant its own modeling zone. The Rainbow Fire area is best modeled as brush.

Resistance to control is actually higher in the Rainbow Fire zone due to collapsing snags adding to the fuel load. On high fire danger days, starts in the Rainbow Fire zone are expected to generate rapid rates of spread. The Inyo National Forest fire danger rating weather stations typically display more than four months of fire danger rating in the high to extreme range each year.

The main ignition source for the monument is expected to be its visitors. Visitor use on both the Forest and the monument is high and increasing in numbers. Numerous opportunities will exist for starts during the summer and fall months.

DEPO FMU
<p>The following fuel model distribution depicts NFFDRS (National Fire Danger Rating System) fuel models: Fuel Model G and Fuel Model F.</p>
<p>Control Problems</p> <p>The most significant feature that contributes to wildland fire control problems is the large areas of brush vegetation that occupies the Rainbow Fire area. On days of very high to extreme fire danger, any starts will require rapid initial attack response to achieve successful suppression.</p>
<p>Fire and Fuels Objectives for Unit</p> <ul style="list-style-type: none"> • Restore and maintain natural ecosystem function to the extent possible using prescribed fire, mechanical fuel reduction, and fire suppression. • All wildland fires starting in the unit will be suppressed using the appropriate management response consistent with values to protect. Minimum Impact Suppression Tactics (MIST) will guide all tactical implementation. • Fuel reduction will include the use of mechanical treatments near structures and prescribed fire. Mechanical treatments will generally involve the use of chainsaws to cut and thin woody materials near structures followed by piling of the created debris. Prescribed fire will be used to dispose of the piled material and to achieve hazard fuel reduction or ecosystem restoration or maintenance goals on unit lands.
<p>Values to be Protected</p> <p><u>Special Designations and Features:</u> The two significant geologic features in the monument are the columnar basalt formation giving the monument its name and Rainbow Falls. While neither can be impacted by fire, the scenery surrounding both geologic features can be impacted. It would be desirable to limit high severity fire spread near both features to lessen negative vegetation changes. In addition, 90% or 747 acres of the monument is designated Wilderness. This designation necessitates Minimum Impact Suppression Tactics (MIST) for any wildland fire operation in the monument that occurs in Wilderness.</p> <p><u>Monument Developments:</u> The monument has limited structures. Structures are concentrated near the north end of the monument which will simplify structure protection from unwanted fires and help with fuels reduction activities surrounding the buildings prior to any unwanted fire.</p> <p><u>Vegetation:</u> Because such a large portion of the monument burned in the Rainbow Fire with fairly high severity, fire management options will mostly concentrate on suppressing fire starts in order to give the monument a chance to recover.</p>
<p>Further Compliance Needs</p> <p>The scope of proposed actions and their expected effects are described in the companion Environmental Assessment (EA). All mitigating actions contained in the EA will be implemented for projects conducted within this unit.</p> <p>Cultural resource consultation with the park archeologist will take place during the planning phase for all projects. In addition, mechanical fuel projects will require consultation with wildlife and plant ecologists during the planning phase to ensure adequate protection for site specific species.</p> <p>Other than actions noted above or as contained in the EA, no additional environmental compliance will be required for projects that fall within the scope of projects and effects described in the EA.</p>

4. WILDLAND FIRE PROGRAM COMPONENTS

General Implementation Procedures

All unplanned wildland fires will be suppressed using the appropriate management strategy in a prompt, safe, and cost-effective manner with minimum damage to resources. The appropriate suppression response taken will ensure firefighter safety, public safety, and resource protection. Resource impacts of suppression alternatives must always be considered in selecting a fire management strategy. Minimum impact suppression techniques (MIST) will be used in all wilderness areas. Use of mechanical equipment will not be authorized without the approval of the superintendent.

Sequoia and Kings Canyon National Parks fire management staff serve as the subject matter experts who provide oversight and coordination on fire management issues for the monument. As such, all fire management work for the monument begins with park staff.

Wildland Fire Suppression

Initial wildland fire response will be conducted by Inyo National Forest resources under the Suppression Response Plan (Addendum). All fires not classified as prescribed fires are wildland fires and will be appropriately suppressed.

All wildland fires will be assessed individually by preparing the appropriate level of a *Wildland Fire Implementation Plan* (WFIP). From this plan the *appropriate management response* will be chosen. The procedures that will be followed are outlined in Chapter 4 of the *Wildland and Prescribed Fire Management Policy Implementation Procedures Reference Guide* (Addendum). Assessment includes data gathering and situation analysis (i.e. internal and external values which are enhanced or require protection, management objectives, safety, climatology and weather, fuel conditions, and fire behavior). The *appropriate management response* ranges from monitoring with minimal on-the-ground disturbance to intense suppression actions on all perimeters of the fire. The response may vary from fire to fire and even between different sections of the perimeter of a single fire.

For extended attack and large fire response, Sequoia and Kings Canyon National Parks fire staff will work with the Inyo National Forest to continually validate that the fire is managed appropriately and will assess the need to complete a *Wildland Fire Situation Analysis* (WFSA). Examples of situations that may indicate the need for WFSA completion include: 1) not meeting control objectives by the end of the second burning period, 2) incrementally increasing number of resources to achieve containment objectives, and 3) unexpected fire behavior. Completed WFSAs will allow for the full range of strategic and tactical actions from full suppression on all perimeters to confinement within a drainage or area. If the fire exceeds the capabilities of local Inyo National Forest resources, crews and overhead will be requested from outside the Forest. If the management complexity of the fire exceeds the capabilities of these local resources, the Forest and parks fire staff will manage the incident through delegation to a Type II or I Incident Management Team (see Appendix F).

Monitoring and Rehabilitation

Every fire will receive periodic assessment until declared out. Rehabilitation will follow Minimum Impact Suppression Techniques (MIST) as outlined in the *Interagency Standards for Fire and Fire Aviation Operations 2004* handbook (Addendum). In the event a fire covers large areas, has unnaturally severe effects on natural and/or cultural resources, or causes major impacts to the monument's developed resources (i.e. trail system) a separate *Burned Area Emergency Rehabilitation Plan* will be developed, and be approved by the monument superintendent.

Documentation and Cost Tracking

Fire reports for monument fires will be generated by Inyo National Forest employees as first responders, then shared with Sequoia and Kings Canyon National Parks fire dispatch office for input into the Department of Interior wildland fire reporting system. For large fire response, a final fire narrative will be shared with the monument superintendent and Sequoia and Kings Canyon National Parks fire staff by the outgoing incident management team. All expenditures (personnel, aircraft, supplies, and equipment) will be tracked and reported according to the standards established in the Department of the Interior Individual Fire Occurrence Form (DI-1202). All wildland fires will have an appropriate fire management accounting code.

Preparedness Actions

Preparedness is the work accomplished prior to fire occurrence to ensure that the appropriate management response, as directed by the *Fire and Fuels Management Plan*, can be carried out. Preparedness activities include fire prevention, training and fitness, fire readiness, and suppression response plan.

Due to the small size of the monument and number of personnel, the monument will establish a clear operational process that allows the Inyo National Forest to effectively suppress wildland fires within the monument and provides a clear set of objectives for other fire management activities initiated by the monument. The following preparedness actions will be taken to ensure adequate fire preparedness.

Fire Prevention

An active fire prevention program will be conducted in conjunction with the Inyo National Forest to protect human life and property, and prevent damage to monument resources. It is essential that employees be well informed about fire prevention and the objectives of the site's fire management program. Further, employees must be kept informed about changes in existing conditions throughout the fire season.

Trained employees need to relate information to the public essential to understanding the potential severity of human- caused wildland fires and how to prevent them. During periods of extreme or prolonged fire danger, fire prevention messages will be included in interpretive programs. Instructions regarding public information and education can be found in Chapter 9.

Emergency restrictions regarding fires or area closures may become necessary. Such restrictions, when imposed, will be consistent with those implemented by the Inyo National Forest. Closures will be authorized by the Superintendent.

Training and Fitness

Departmental policy requires that all personnel engaged in wildland fire management duties meet the standards set by the National Wildfire Coordinating Group (NWCG) as well as Department of Interior standards. These standards call for medical exams and fitness testing for arduous duty fireline assignments, as well as completion of required course work and task book certification for fireline positions. The National Park Service wildland fire qualification system meets or exceeds all NWCG and Department of Interior standards. Devils Postpile National Monument will conform strictly to the requirements of the NPS wildland fire management qualification and certification system.

The monument has no fire management staff. Sequoia and Kings Canyon National Parks fire management staff serve as the subject matter experts for the monument's fire management needs. As such, they must advise the monument Superintendent on appropriate fire management activities, including training and fitness. These parties have agreed that the Inyo National Forest fire management program can best meet the suppression response needs of the monument. None of the monument staff are red- carded for fireline duty. If any staff is carded for duty, Sequoia and Kings Canyon National Parks fire management employees will work with the Inyo Forest to obtain the required training and supplies to outfit monument firefighters. Given the limited number of fire responses required, the current Superintendent has elected to not pursue this course.

Fire Readiness

Fire readiness is the year- round organized inventory and assessment of equipment and personnel. Since the monument's suppression response needs are covered under agreement with the Inyo National Forest, their readiness documentation applies.

Suppression Response Plan

Each spring, a meeting will be required of Sequoia and Kings Canyon National Parks fire staff, Inyo National Forest fire staff, and the monument superintendent to review and update the monument's suppression response plan and associated agreements. The plan outlines monument fire management objectives and constraints so that initial attack response can be successfully implemented. In addition, information necessary for the successful transition to extended attack and large fire response is provided. In the event of extended attack and transition to large fire response, Sequoia and Kings Canyon National Parks' fire staff will provide agency representation for the monument's superintendent.

Mechanical Fuel Reduction

Mechanical fuel reduction is the use of mechanical equipment (i.e. weed whackers, chainsaws, dozers, rubber tired skidders, chippers, etc.) to cut and remove, or prepare for burning, woody fuels. In the monument, mechanical treatments will generally involve the use of chainsaws to cut and thin woody materials near structures followed by piling of debris. Mechanical treatments

are intended to help in achieving resource management objectives, most often a combination of ecosystem restoration and reduction of high hazard fuel loading objectives. Mechanical treatments must be described in a mechanical treatment plan. The plan will contain a prescription defining goals, objectives, and treatment methods employed to achieve the objectives (Appendix E). Fuels management prescriptions are detailed in Appendix G. Projects outside the bounds of this environmental assessment will require further environmental analysis unless covered under the Healthy Forests Initiative Act.

Mechanical treatment may be used in concert with prescribed fire treatment. High hazard fuel conditions can be reduced while meeting structural objectives in areas immediately adjacent to infrastructure values or in boundary areas through a mix of mechanical treatment and prescribed fire. Mechanical treatment can be used as the primary method of reaching structural goals while prescribed fire actually removes the hazardous fuels.

Examples:

- Prescribed fire has been used extensively to reduce fuels and restore natural conditions in a large area uphill from a development. However, the fuels complex immediately adjacent to the structures presents significant prescribed fire control problems and the only practical method for reducing the hazardous fuels adjacent to the structures may be through the use of mechanical techniques and then burning the slash pile accumulations.
- Heavy fuels immediately adjacent to structures, if burned, will cause an unacceptable amount of large trees to be injured or killed resulting in an increase in hazard trees. Mechanical treatment is used before prescribed burning in order to reduce the potential of the burn causing future hazard trees.

Planned Treatment

- **Conduct initial survey to identify areas** that need prescribed fire and/or mechanical treatments by evaluating values, hazards, and risks for the monument. Repeat this survey every five years or more often if determined as being necessary. Situations which may require more frequent surveys are if a large wildland fire burns through the monument (i.e. – such as the 1992 Rainbow Fire), or if significant fuels manipulation is accomplished before the end of five years. The monument geographic information system (GIS), which is located at SEKI, is the primary data storage and analysis system employed to achieve this goal. Where appropriate, treatment across agency boundaries is encouraged and facilitated.
- **Select treatment priorities** based upon the analysis of the values, hazards, and risks. Consider managerial capabilities to accomplish treatments given practical limitations in planning, finance, and logistical support.
- **Write an annual fuels treatment plan if fuels treatment is planned for a particular year** that describes the program for the up- coming field season including descriptions of individual segment preparation and execution needs. Insert this annual plan into a revised *5-Year Fuels Treatment Plan* (Appendix A). This document is completed in the spring following consultation with monument staff, Fire Management Committee review and concurrence, and superintendent approval.
- **Distribute the *Fuels Treatment Plan*** to monument staff, SEKI staff as appropriate, and cooperators.

- **Submit the *Fuels Treatment Plan* to the Air District for review.** For mechanical treatment work only, the Air District will not need to review plans. They will review prescribed fire plans that will be developed to treat mechanically generated fuels.
- **Assign project leaders to individual treatment segments.** Project leaders scout the area so that the segment's mechanical treatment plan can be written and crews can begin work. All NPS owned structures will be protected to a reasonable extent from unplanned fire events by the clearance of hazardous fuels on an annual basis. This hazard abatement work will comply with California Public Resource Code (PRC) 4290. Work will be performed by a combination of park fire crews, monument residents, and maintenance grounds keeping crews.
- **Identify the minimum tools required** to complete the project if any portion of the mechanical segment falls within designated wilderness. The use of mechanized equipment in wilderness (including chainsaws and helicopters) must be justified and pre- approved by monument management in non- emergency incidents. This analysis process can be documented in the mechanical plan (completed by the project leader and signed by the Superintendent) or in an annual wilderness operations program submitted by fire managers.
- **Complete mechanical treatment plans** by pay period 15 each year giving the monument staff, SEKI fire management staff, Chief Ranger, and Superintendent adequate time to address any remaining issues associated with the proposed treatment.
- **Notify the public about the annual project list.** At the beginning of fire season, notify local communities, media, businesses, agency partners, and employees about upcoming projects for the year.

Project Implementation

- **Notify the public about the upcoming mechanical project.** Use contact lists and communication methods from *Standard Operating Procedures: Fire and Fuels Information* (Addendum).
- **Monitor vegetation/fuels** against prescriptive criteria.
- **Assess effects of monument and SEKI fire management staff workload** on successful outcome for the project.
- **Notify the public** about the planned treatment.
- **Hold briefing** and review treatment objectives and operations with treatment staff.
- **Begin implementing project.** All projects involving treatment of fuels adjacent to structures must comply with California Public Resource Code 4290.
- **Provide interpretive information** if adjacent to visitor- use area.

Post- Project

- **Rehabilitation** will follow Minimum Impact Suppression Techniques (MIST) as outlined in SEKI's *Fire and Aviation Management Operations Guide* (Addendum). Rehabilitation will be accomplished by the end of the following field season.
- **Assemble monitoring data** as part of the final fire package.
- **Review incident** when deemed appropriate by monument staff, SEKI fire management staff, Superintendent, or Fire Management Committee.

Staffing Needs and Responsibilities

The Kings Canyon District FMO is responsible for the implementation of the mechanical treatment program. This person works closely with the SEKI Fuels Management Specialist on

the development of the annual program and *5- Year Fuels Treatment Plan*. Mechanical hazard fuels abatement prescriptions can be found in Appendix G.

All fire and fuels management activities in the monument will rely on tactics that minimize resource damage while maintaining the safety of the public, firefighters, and other personnel. Tactical tools that are used will be chosen based on a minimum requirement / minimum tool (MR/MT) analysis.

Documentation and Cost Tracking

The project folder will contain copies of all documents as outlined in Appendix B (Wildland and Fuels Management Reporting Requirements). The folder will include: all planning documents (treatment plan and any amendments, incident action plans), monitoring data and summary reports, personnel time reports, maps, photos, and fuels accomplishment summary reports. All expenditures (personnel, aircraft, supplies, and equipment) will be tracked and reported according to the standards established in the Department of the Interior Individual Fire Occurrence Form (DI- 1202). All projects will have an appropriate accounting code.

It will be the responsibility of the Kings Canyon District FMO, or his/her project leader to ensure treatment report completion. The report is a valuable tool as it provides an historical record of the fuels treatment history for the monument. At this time DI- 1202's cannot be completed for mechanical treatments. They are only completed for projects involving fire occurrence. It will be the responsibility of the SEKI Fuels Management Specialist to input all fuels accomplishments into the National Fire Plan Operations and Reporting System (NFPORS).

Special Considerations

Slash fuels that are derived from mechanical treatments and hazard tree removal operations can be burned for disposal purposes. Slash piles within the monument will be burned by either NPS fire personnel, USFS fire personnel, or a certified contract fire crew, and will adhere to prescribed fire guidelines per RM- 18.

The Kings Canyon District FMO is responsible for the coordination of burning slash piles within the monument. Slash pile burning operations will comply with RM- 18. Slash produced from mechanical projects may also be chipped in place, or chipped and hauled away from the site as indicated in the individual treatment plans.

Prescribed Fire

Definition

Prescribed fires are ignited by management to achieve resource objectives, most often a combination of ecosystem restoration or maintenance objectives and reduction of high hazard fuel loadings. These objectives are not mutually exclusive and usually all prescribed fire operations contain a mix of them. As all lightning- caused fires in the monument are suppressed, prescribed fire may be used to replace these suppressed natural ignitions.

Prescribed fires must be described in a prescribed fire burn plan. The plan will contain a prescription defining goals, objectives, and treatment methods employed to achieve the objectives (Appendix E). Fuels management prescriptions are detailed in Appendix G.

Prescribed fire may also be used in concert with mechanical treatment. High hazard fuel conditions can be reduced while meeting structural objectives in areas immediately adjacent to infrastructure values or in boundary areas through a mix of mechanical treatment and prescribed fire. Mechanical treatment can be used as the primary method of reaching structural goals while prescribed fire actually removes the hazardous fuels.

Examples:

- There is a hazardous accumulation of fuels adjacent to infrastructure values that can be mitigated with the use of prescribed fire. The main objective of the burn operation will be reducing high hazard fuels with ecosystem restoration as a secondary consideration.
- There is a drainage that requires restoration of the ecological fire process. There are no infrastructure values or boundary issues. The main objective of the burn will be restoration of ecological processes. The secondary objective will be reducing high hazard fuels.
- There is a drainage that has been prescribed burned for ecosystem restoration. The drainage has missed 1 or 2 fire return intervals and is showing signs of high hazard fuels build-up, species composition shift, and increased stand density. The main objective of the burn will be for ecosystem maintenance purposes.

Planning

- **Conduct initial survey to identify areas** that need prescribed fire and/or mechanical treatments by evaluating values, hazards, and risks for the monument. Repeat this survey every five years or more often if determined as being necessary. Situations which may require more frequent surveys are if a large wildland fire burns through the monument (i.e. – such as the 1992 Rainbow Fire), or if significant fuels manipulation is accomplished before the end of five years. The monument geographic information system (GIS), which is located at SEKI, is the primary data storage and analysis system employed to achieve this goal. Where appropriate, treatment across agency boundaries is encouraged and facilitated.
- **Select treatment priorities** based upon the analysis of the values, hazards, and risks. Consider managerial capabilities to accomplish treatments given practical limitations in planning, finance, and logistical support. In addition, significant suppression fires (i.e. – any fire which escapes initial attack) will be factored into the decision to implement planned prescribed fire ignitions in the same year.
- **Write an annual fuels treatment plan if fuels treatment is planned for a particular year** that describes the program for the up-coming field season including descriptions of individual segment preparation and execution needs. Insert this annual plan into a revised *5-Year Fuels Treatment Plan* (see Appendix A). This document is completed in the spring following consultation with monument staff, the SEKI fire management committee review and concurrence, and superintendent approval. The annual fuels treatment plan is approved by the SEKI superintendent via a signed Fuels Treatment Verification Form.
- **Distribute the *Fuels Treatment Plan*** to monument staff, SEKI staff as appropriate, and cooperators.

- **Submit the *Fuels Treatment Plan* to the Air District for review.** Note that air quality regulations and requirements are dynamic and subject to change. The process described below is in effect at the time of this document's publication. Updated procedures and requirements enacted after the approval date of this plan will be incorporated in annual updates to the *Fire and Fuels Management Plan*. While the District does not have authority to approve or reject this overall *Fuels Treatment Plan*, it does provide input to the individual prescribed fire burn plan. Air quality concerns remain the major issue affecting prescribed fire treatment.
- **Notify the public about the annual project list.** At the beginning of fire season, notify local communities, media, businesses, agency partners, and employees about upcoming projects for the year.
- **Assign a Burn Boss to each individual treatment segment.** Each Burn Boss scouts the area so that the segment burn plan can be written and crews can begin prep work.
- **Identify the minimum tools required** to complete the project if any portion of the burn segment falls within designated wilderness. The use of mechanized equipment in wilderness (including chainsaws and helicopters) must be justified and pre- approved by monument management in non- emergency incidents. This analysis process can be documented in the burn plan (completed by the Burn Boss and signed by the Superintendent) or in an annual wilderness operations program submitted by fire managers.
- **Complete burn plans** by pay period 15 each year giving the monument staff, SEKI fire management staff, Chief Ranger, and the Superintendent adequate time to address any remaining issues associated with the planned prescribed fire.
- **Submit each individual burn plan to the District for review under Rule 4106.** The Air District has up to 30 days to review individual burn plans. They are required to inform the parks of concurrence or to request changes at the end of the 30- day period. Burn plans will describe the smoke management parameters necessary to provide optimum smoke dispersal based on burn goals and objectives, location, fuel loading and predicted fuels consumption, length of ignition and burn down, and proximity to Smoke Sensitive Areas (SSAs). Burn plan contingencies will also include a description of the decision process that management will take to limit smoke impacts if smoke conditions deteriorate in SSAs and the coordination requirements with the District. Minimum safe roadway visibility is described and the mechanism for maintaining safe use of the roads is explained in detail.
- **Complete the District smoke management summary** and submit with the burn plan. The District uses the smoke management summary to permit burns. Smoke management plans will also describe alternatives considered in lieu of burning and earlier treatments employed which have already reduced potential emissions. Discussion will provide why alternatives were rejected and how earlier treatments have provided mitigation for current burning.
- **Request pre- ignition forecast.** No more than seven days prior to the earliest ignition date, a request will be submitted to the District to begin long- range smoke dispersal forecasting for the proposed ignition (PIFA forecasts). After a seven day waiting period, the District will provide 96- , 72- , and 48- hour outlooks, and 24- hour forecasts on days leading up to the proposed ignition date. The District retains final go/no- go authority until the time of ignition.

Project Implementation

- **Notify the public about the upcoming ignition.** Use contact lists and communication methods from the *SEKI Standard Operating Procedures: Fire and Fuels Information*,

emphasizing the applicable contacts in the monument area (Addendum). In addition to regular information about project logistics, location, and objectives, use appropriate smoke information and recommendations from the SEKI *Smoke Communication Strategy* (Addendum).

- **Monitor weather and fuels** against prescriptive criteria. Prescribed burns are ignited when weather conditions are favorable for dispersing smoke away from Smoke Sensitive Areas (SSAs), or during conditions that dilute smoke so that impacts to SSAs do not exceed health standards. This will be accomplished by utilizing the most current and comprehensive weather forecasting information available for predicting smoke transport direction and concentration down wind. Fuel moisture is also a high priority prescription element that will be monitored pre- burn. Fuel moisture prescriptions are designed to provide the optimum balance between the need to moderate fire behavior, minimize undesired fire effects on other resource values, and minimize smoke production (drier fuels burn cleaner and produce less pollutants). Fuel moisture information will be obtained and analyzed pre- burn for all significant categories of fuels (litter/duff, 1- , 10- , 100- and 1000- hour fuels) to ensure conformity with the prescription.
- **Assess effects of monument and SEKI fire management staff workload** on successful outcome for the burn. Consider the cumulative air quality effects of the upcoming project and any local wildland fires that may already be burning in the area. If effects cannot be mitigated, postpone the planned burn.
- **Obtain Superintendent (SEKI) go/no go decision** on ignition.
- **Seek concurrence from the Air District** to proceed with ignition.
- **Dispersion Intelligence.** Smoke dispersion potential (the capacity of the atmosphere to absorb and disperse smoke) is carefully evaluated prior to a burn being ignited and during unit execution. Several methods can be utilized:
 - Standard National Weather Service fire weather forecasts are reviewed for favorable dispersal winds aloft. Generally, ridge winds from the west at 10 to 15 mph are desirable. Data provided by various Internet sources provide detailed information on regional weather trends.
 - Pre- fire spot weather forecasts are requested from the National Weather Service to provide detailed smoke dispersal information. Predicted unstable atmospheric conditions are optimal, although fire managers must weigh instability against the ability of fire behavior to become erratic and escape. The District's meteorologists provide additional dispersal information for burns at all elevations.
- **Hold briefing** and review burn plan operations with burn staff.
- **Ignite a test- fire.**
- **Make final go/no go decision on ignition** (Burn Boss and associates).
- **Ignition occurs.** Fire Management staff will proactively regulate the number of acres burned each day. Two factors are of critical importance: emissions produced per day and duration of smoke produced. For prescribed fire treatments of forested areas near SSAs, acreage treated in restoration burns may be limited to about 50 acres per day, with twice that acreage for maintenance treatments. This limit serves only as a guide with acreage treated varying due to terrain, proximity to SSAs, fuel conditions (i.e. – loading, dryness, and fuel model), meteorological conditions, etc. Duration of smoke produced from fires will vary with the fuel type. Timber fires, due to fuel loading inclusive of duff, burn for the longest time periods. With half the duff present on most maintenance burns, duration is significantly

reduced. Again, as a general rule, smoke production near SSAs should be kept to less than 5 days before significant reduction in particulate load production occurs.

- **Monitoring of meteorology and air quality conditions** will follow through ignition completion and burn down of remaining available fuels. Qualified fire personnel will conduct all smoke monitoring. Personnel will monitor smoke impacts to SSAs and transmit that information to the Burn Boss to utilize the intelligence gathered to adapt burn execution to avoid unhealthful smoke impacts. This will be accomplished by visual observations on small fires and short duration fires (e.g. grass fires). On fires in close proximity to SSAs, that may be of long duration or possess heavy fuel loading, monitoring will include equipment to measure particulate load production, collect 24 hour weather data, and document visibility conditions with photography.
- **Aerial resources can be used to assess the atmospheric adiabatic lapse rate** before and during burn unit execution- - which helps with interpreting the capacity of the atmosphere to disperse smoke. Helicopter crew members also conduct visual observations of burn unit smoke dispersal and record the observations.
- **Provide on- site interpretative information** if adjacent to visitor- use area.
- **Report daily fuel treatment accomplishments and emissions** to the Air District.
- If the fire exceeds prescription criteria, **notify the SEKI Superintendent and monument staff of the escape and initiate a *Wildland Fire Situation Analysis* (WFSA).**
- **Notify the public when the project is complete.**

Post- fire

- **Rehabilitation** will follow Minimum Impact Suppression Techniques (MIST) as outlined in SEKI's *Fire and Aviation Management Operations Guide* (Addendum).
- **Assemble monitoring data** as part of the final fire package.
- **Conduct After Action Reviews** after each project with the burn participants and appropriate staff.
- **Review incident** when deemed appropriate by monument staff, SEKI fire management staff, Superintendent, or SEKI Fire Management Committee.
- **Report final fuel treatment accomplishments and emissions** for the project to the Air District. Projects greater than 250 blackened acres will be required to complete an Air District post- burn summary.
- **Enter acreage accomplishment into NFPORS.**

Staffing Needs and Responsibilities

The Kings Canyon District Fire Management Officer is responsible for the implementation of the annual fuels treatment program in the monument. This person works closely with monument staff and the SEKI Fuels Management Specialist on the development of the annual program and associated *5- Year Fuels Treatment Plan*. A team comprised of monument staff, the Kings Canyon District FMO, the SEKI Fuels Management Specialist, and the SEKI Fire GIS Specialist will meet to compose the plan. The Kings Canyon District FMO is responsible for prescribed burn plan completion.

Each burn will be staffed by an agency- certified Burn Boss (appropriate to the level required), as well as other staff necessary to conduct the operation safely and efficiently. Working with the SEKI Fuels Management Specialist, the Kings Canyon DFMO will assign Burn Bosses to individual burn units, who must ensure appropriate staff is assigned to each burn. Burn Bosses

and other staff may be provided by local U.S. Forest Service cooperators as is convenient for both agencies. Individual segment burn plans will comply with requirements described in RM-18. Prescribed fire burning prescriptions can be found in Appendix G. Individual prescribed fire operations can last from one day to several months.

Close coordination and strong communication is required between operational overhead, the assigned fire information and education specialist, fire effects and research program staff, general monument staff, local air quality control district staff, and local cooperators and dispatchers. The Kings Canyon District FMO will ensure coordination occurs between the Air District and the Burn Boss. Fire and aviation dispatch will track all PIFA and spot fire weather forecasts, and serve as an information gatekeeper when Burn Bosses are assigned and unavailable for telephone conversations with Air District enforcement staff. The SEKI Fuels Management Specialist will check the whole system ensuring coordination at the burn plan/smoke management plan phase, execution phase, and post- fire stage occurs.

All fire management activities in the monument will rely on tactics that minimize resource damage while maintaining the safety of the public, firefighters, and other personnel. Tactical tools that are used will be chosen based on a minimum requirement / minimum tool (MR/MT) analysis.

Air Quality and Smoke Management

See Appendix C, Smoke Management Plan.

Documentation and Cost Tracking

The fire folder will contain copies of all documents as outlined in Appendix B (Wildland and Fuels Management Reporting Requirements). The folder will include: all planning documents (burn plan and any amendments, smoke permit, incident action plans), monitoring data and summary reports, fire time reports, maps, photos, and DI- 1202. All expenditures (personnel, aircraft, supplies, and equipment) will be tracked and reported according to the standards established in the Department of the Interior Individual Fire Occurrence Form (DI- 1202). All prescribed fires will have an appropriate accounting code.

It will be the responsibility of the Kings Canyon District FMO, or his/her burn boss on the fire to ensure fire report completion. The report is a valuable tool as it provides an historical record of the fire regime for the parks. The DI- 1202 is the basic document used by the National Interagency Fire Center (NIFC) to document a fire occurrence.

Special Considerations

Climatological weather data analysis is used to assess the probability of season ending weather events as an aid in prescribed fire planning. The closest weather station at a similar elevation often serves as the representative record.

4. ORGANIZATION AND BUDGET

Organizational Roles

Superintendent of Sequoia and Kings Canyon

- Supervises Superintendent of Devils Postpile National Monument.

Superintendent of Devils Postpile National Monument

- Has ultimate responsibility and accountability for all fire and fuels management activities in the monument.
- Certifies Fire and Fuels Management Plan and all other plans written within that framework (i.e. WFIPs and their periodic validations, WFSAs, burn plans, and mechanical treatment plans). Approval constitutes the authority to proceed with the actions outlined.
- Reports to Superintendent of Sequoia & Kings Canyon National Parks

Fire Management Officer for SEKI

- Responsible for management of monument's fire program.
- Ensures coordination with all divisions and FMC on fire planning and operations issues.
- Ensures coordination with external agencies for interagency cooperation in fire and fuels management planning and operations.
- Develops program budget annually ensuring a cost efficient program.

Fire Budget Assistant for SEKI

- Serves as subject matter expert for all fire business management issues.

Communications Center/Cache Manager for SEKI

- Ensures 1202 data base for wildland fire responses is current. Integrates this work with GIS specialist for GIS analysis.
- Ensures logistical support for all fire/aviation planning and fuels treatment operations.

Fuels Management Specialist for SEKI

- Principal staff specialist for fuels management.
- Takes lead on yearly fire GIS analysis planning update.
- Coordinates projects with fuels planners from cooperating agencies.

Kings Canyon District FMO

- Responsible for monument's fuels treatment program.

Cache Manager

- Manages logistics in support of all fuels treatment operations.

Fire Ecologist

- Develops and implements fire effects monitoring program based upon structural and process objectives for the vegetation communities. Ensures that results from fire effects

monitoring and fire research are integrated into the fire and fuels management program. Analyzes and reports results from monitoring data so that fire management operations can be adjusted to better meet structural and process objectives.

- Addresses fire related natural resource issues
- Coordinates park research needs.
- Summarizes significant findings of all park fire research in reports circulated internally and externally.

Air Quality Management Specialist

- Serves as air quality specialist.
- Coordinates air quality data and information exchange with Fuels Management Specialist.
- Provides quality assurance/quality control advice for smoke and weather technician.

Fire GIS Specialist

- Maintains fire databases.
- Provides project level spatial analysis and mapping for all fires.
- Provides spatial analysis and map products for fire and fuels management planning.

Fire Information and Education Specialist

- Communicates with internal and external audiences about fire and fuels management program activities.

Fire Management Funding

No funds are currently provided for the monument's fire program. The monument lies within Fire Planning Unit #9, California, along with the Inyo National Forest and Manzanar National Historic Site. Future fire funding is dependent upon the interagency Fire Program Analysis (FPA) System.

6. MONITORING AND EVALUATION

All NPS units that implement fuels treatment activities must develop short- and long- term *monitoring programs* to assess accomplishments and to determine the effects of management activities on cultural and natural resources in the parks. While the fire and fuels management program is based on a broad array of scientific research that clearly illustrates the important role of fire in the monument's ecosystems, monitoring is essential to provide feedback information about the effects of management activities.

Monitoring is essential to determine if management objectives are achieved, as well as to detect unexpected and undesired consequences of management activities. Using feedback from ongoing monitoring results, the fire and fuels management program can adapt to changing needs with the best available information. This monitoring information is especially useful because it is obtained directly from park management activities, and therefore, has direct, local application.

A *Fire and Fuels Monitoring Plan* has been developed for SEKI to describe current monitoring efforts and proposed needs and will be updated annually (Addendum). Fire effects monitoring at DEPO falls under the umbrella of the SEKI Division of Natural Resources fire effects program. The *Fire and Fuels Monitoring Plan* covers the four levels of fire monitoring identified in the *NPS Fire Monitoring Handbook* (NPS 2001) including environmental monitoring, fire observation, short- term effects, and long- term effects. The *NPS Fire Monitoring Handbook* provides guidelines for monitoring fire management activities to meet NPS needs. Because this *Fire and Fuels Management Plan* includes mechanical treatment as a tool for fuel and fire manipulation, the monitoring plan also includes protocols for mechanical treatment monitoring. Guidelines for monitoring mechanical treatments are preliminary, with most of the focus on short- and long- term monitoring, the same as for sites treated with fire.

The *Fire and Fuels Monitoring Plan* applies to monitoring efforts across both spatial and temporal scales, from site- specific up to the landscape- level, and from immediate post- fire to long- term effects. For example, in areas where heavy fuels have accumulated as a result of past fire exclusion, fuels will be monitored to determine when fuel loads have been restored by fire reintroduction. In other areas where fuel and vegetation conditions have not been greatly altered by fire exclusion, or in areas that have been restored, fire frequency, severity, and season will be monitored to insure the long- term maintenance of the historic fire regime. Correspondingly, in areas where mechanical manipulation of fuels is needed (due to presence of human structures) prior to burning of woody debris piles, fuel loads will be monitored as well as vegetation change. In the monument, post- fire recovery of the high severity 1992 Rainbow Fire is being monitored.

The plan describes the monitoring program by subject matter including weather and fire behavior, fuels, vegetation, wildlife, water, cultural resources, and fire regime. Each subject area section outlines monitoring objectives, sampling design (including specific field protocols), locations, and a schedule appropriate for each subject matter area. Monitoring protocols are reviewed at the regional office level to insure that methods are appropriate and funding for monitoring is adequate.

Information from other monitoring efforts will also be used to inform the fire and fuels management program where pertinent. For example, results from the parks' Inventory and Monitoring Network Program may be useful to assess the changes occurring in areas of the monument affected by wildland fires and areas where fire has been excluded for long periods.

7. RESEARCH

Natural science *research* is and will continue to be an important activity in the monument. It serves two primary purposes in relation to the fire and fuels management program. First, it helps to define both natural fire regimes as well as the range of natural conditions that serve as ecological foundations for the application of fire in monument ecosystems. Second, it is used as a tool to evaluate actions used to restore and/or perpetuate desired conditions as contemplated in the policies for management of natural areas in the National Park Service. This research can have either tactical or strategic applications. Such research will continue to be encouraged and supported in an effort to further improve the monument's fire and fuels management program.

While considerable fire related research has been conducted in Sequoia, Kings Canyon, and Yosemite National Parks on the west slope of the Sierra Nevada few studies have included Devils Postpile. However, information from these studies is somewhat applicable to the monument's mixed- conifer forest (Kilgore 1972; Kilgore and Taylor 1979; Parsons and DeBenedetti 1979; Stephenson and others 1991; Caprio and Swetnam 1995; van Wagtendonk 1995; Skinner and Chang 1996; Mutch and Parsons 1998; Swetnam and others 1998; Miller and Urban 1999, 2000; Stephens. 2000, 2001; Caprio 2004) and high elevation forests and meadows (Vankat 1970; Kilgore 1971; DeBenedetti and Parsons 1984; Pitcher 1981, 1987; Caprio in press). While much is known from these studies, in many cases they have not provided the full level of detail necessary to completely understand natural fire regimes or the long- term effects of variable intensity fires on subtle ecosystem properties. This is especially true for the area of DEPO.

Research needs and priorities are jointly identified by the Division of Natural Resources and DEPO management staff. They are documented in the parks' *Natural and Cultural Resources Management Plan*. Such research may include in- house studies, interagency or cooperative agreements, contracts, or independent investigations. All fire- related research is closely coordinated with fire and fuels treatment operations and fire and fuels monitoring efforts in order to assure maximum application of findings to both the management and interpretation programs.

8. SAFETY

Fire Fighter Safety

Firefighting is an inherently dangerous operation that requires all personnel involved to exercise caution and judgment. The dangerous nature of this work does not allow any margin for error. If any fire or fuels management action cannot be carried out safely, another action must be utilized.

Prevention of injury or death is the overriding consideration during all operations. It is the responsibility of each and every person involved in an operation to ensure safety. At no time will the protection of resources be placed before the safety of fire management personnel. The Fire Management Office at Sequoia and Kings Canyon National Parks outlines safety policy in more detail in the *Fire and Aviation Management Operations Guide* (Addendum). National Park Service firefighters employed or working at the monument will adhere to safety procedures outlined in the above mentioned document.

In areas where firefighter safety mitigations are difficult or impossible to achieve, the monument may opt for less aggressive control strategies and accept fire spread over a greater number of acres.

Safety Committee

The Fire and Visitor Management division safety committee at SEKI will address safety issues pertaining to the monument's fire and fuels management activities. Members of this committee will include branch chiefs within the division including the fire management officer. This committee shall advocate that all operations be carried out in accordance with established safety practices as set by *Reference Manuals 18, 58, and 60*, the *Fireline Handbook* (NWCG 410-1), OSHA, the *SEKI Risk Management Plan*, policy, and the division safety plan.

The committee is not meant to replace the role of fire program managers and first line supervisors, but rather to expand the availability of safety information for firefighters. Program managers and first line supervisors are responsible for the establishment of Job Hazard Analyses (JHAs) which are written descriptions of hazards and corresponding mitigations for fire operations. Program managers will regularly review, modify, and update JHAs. Furthermore, the established JHAs will be readily accessible for crews so they may be able to integrate them into daily operations and projects. Currently, these JHAs are available on the SEKI computer network under *S:/Safety/JHA- 2*.

Wildland Fire Program

Due to many decades of fire suppression, unnatural fuel loads have accumulated in certain areas of the monument creating the potential for dangerous fires. National Park Service firefighters will only be allowed on an active wildland fire after receiving proper equipment and training as specified in *Reference Manual - 18*. This includes an annual eight- hour wildland firefighter

safety class. Inyo National Forest firefighters responding to monument fires will adhere to Interagency Fire Standards.

Furthermore, wildland firefighters must meet minimum physical standards for their assigned incident position, as defined in NWCG 310-1 “Wildland Qualifications Subsystem Guide.” Physical fitness/work capacity tests for wildland firefighters and other fire-qualified employees will consist of the “pack test.”

Per the 2004 Medical Standards, all permanent, subject-to-furlough, and term employees must complete a baseline medical exam. Those employees below age 45 must complete an annual medical exam every year and a periodic exam every five years. Employees above age 45 must complete an annual medical exam every year and a periodic exam every three years. Temporary employees below age 45 must complete an annual medical exam every year. Those over age 45 must complete an annual medical exam every year and a periodic exam every three years.

Public and Employee Safety

During fire operations or extreme fire danger, fire restrictions and emergency closures may be needed to ensure public safety. These restrictions can also reduce the possibility of human-caused fires during seasonal drought or extreme fire conditions. Emergency closures (i.e. trails in a fire area) may be declared by an Incident Commander to prevent imminent danger. Consultation with the monument site manager will occur as soon as possible. For longer term restrictions or closures (i.e. Stage 1, Stage 2 fire use restrictions), a special order will be issued by the Inyo National Forest through coordination with the monument and given wide distribution. For all restrictions and closures, signs will be posted and maintained in appropriate areas.

An evacuation plan will be in place and ready in the event of an unforeseen dangerous wildfire. When a fire threatens visitor or employee safety, monument personnel need to be given as much advance notice as possible in order to achieve orderly evacuation. The monument will develop an evacuation plan and keep it at the site manager’s office, so it can be activated when an emergency dictates the need. The evacuation procedures of monument residents will also be outlined in this plan.

During certain fire operations (such as prescribed fires), the parks may decide to keep trails open and allow visitors access to the fire area. If this happens, firefighters and interpreters on scene will answer questions and give safety messages to the public. Firefighters or other monument staff may also serve as escorts through fire areas. The monument will supply media representatives with personal protective equipment (PPE) when needed.

9. PUBLIC INFORMATION AND EDUCATION

Goals

Based on the ecological principles and operational procedures outlined in this *Fire and Fuels Management Plan*, the monument is committed to providing accurate and timely information for the public about unplanned fire incidents and planned projects.

Staffing

The Fire Information and Education Specialist at Sequoia & Kings Canyon National Parks (in this document referred to as the FIO) will assist with public outreach and will provide subject-matter expertise related to this field. Using some operational procedures outlined in *Standard Operating Procedures: Fire and Fuels Information* (Addendum), the FIO will ensure the consistency of messages and content.

Staff at the monument will serve a critical function in helping prepare for and notify appropriate target audiences about fire activities in cooperation with the FIO. For example, the interpretive program at the monument will develop stories for the public about fire ecology, fire history, and operations. The success of any fire information program depends on the cooperation and participation of many different partners.

When a large incident occurs in the parks beyond the ability of the staff to handle, the FIO will recruit personnel for specific duties or outside resources will be requested through dispatch procedures.

Target Audiences

The monument has identified four target audiences for fire information and education messages:

- Park Visitors** (including in- park visitors, internet visitors, and special groups)
- Park Employees** (including federal, non- profit, and volunteers)
- Local Communities** (including residents, businesses, civic groups, and clubs)
- Media** (including print, television, radio, and film)

Communication Methods

The following are examples of methods that can be used to communicate with the target audiences listed above. There are both personal and non- personal methods which will facilitate reaching the greatest number of people. The FIO and monument staff will continue to improve and expand this list.

Personal

- **Interpretive Programs** – Monument staff will integrate fire messages into hikes, walks, campfire programs, and special off- site presentations.

- **Employee Training** –Employee training sessions will be offered to improve staff understanding of the fire and fuels management program.
- **Roving** – During fire operations, park employees will be stationed in high- use visitor areas, including trails, to answer questions about the current activity and/or explain the fire and fuels management program.
- **Conference Presentations** – Monument staff or staff from SEKI will give peer presentations at conferences about current fire research, planning, or operations. These presentations will share information, generate feedback, and ultimately improve the fire and fuels management program.
- **Special Events** – The monument staff will, when possible, participate in local events to promote the fire and fuels program. For example, employees can staff booths at local fairs or host community meetings.
- **Public Meetings** – As needed, the monument will conduct special public meetings related to a specific fire event, planning effort, or to share general program information.
- **Media Interviews** – The FIO, or monument representative, will complete in- person or phone interviews for print, radio, and television outlets. When necessary, special media projects (books, documentaries, etc.) will be facilitated by guiding research, scheduling interviews with park staff, and coordinating filming schedules.

Non- Personal

- **Press Releases / Updates** – The FIO will use email, fax, and bulletin boards to distribute press releases / updates for all target audiences as needed.
- **Publications** – The monument will include fire and fuels information in regular publications such as newspapers and brochures.
- **Visitor Center Exhibits, Waysides, and Bulletin Boards** – The monument, with assistance from the FIO, will maintain and update the interpretive information in visitor centers and wayside exhibits on fire and fuels management.
- **Webpage** – The FIO will assist with the entry of information about monument projects and/or incidents on the national Fire and Aviation Management webpage called “Fire News.”

10. PROTECTION OF SENSITIVE VALUES

Sensitive resource values have the potential to be impacted by fire and fire management actions. However, mitigation efforts are designed to minimize those impacts and to prevent any possible resource impairment.

Cultural Resources

An archeological inventory of all of the land within the monument was written in 1993 (Hull and Hale 1993). The fieldwork was conducted in late 1992, shortly after the Rainbow Fire swept through approximately 85 percent of the monument's acreage. Surface visibility was optimal.

The Cultural Resources Specialist for Sequoia and Kings Canyon National Parks remains the key contact for Devils Postpile National Monument cultural resources concerns. Since the archeological resources in the monument have been located and documented, fire managers will be required to consult with the cultural resources specialist prior to implementing any ground disturbing activities such as those associated with staging areas and the cutting of fireline.

Fireline construction or any other ground disturbing activity planned for prescribed and mechanical fuel projects will be flagged in advance of any work on the ground, and must receive clearance and approval from the park archeologist prior to the work.

The cultural resources specialist will specify requirements necessary for the protection of significant resources within the project area which will be documented in each individual burn or mechanical fuel treatment plan. If any new, unrecorded archeological resources are uncovered during non-emergency fire operations, all work would immediately cease in the discovery area and the cultural resources specialist would be consulted.

For unwanted fires, the archeologist will be consulted as soon as practical to identify sensitive resources that have the potential to be affected by the fire or by fire management actions. To the extent possible – and considering short timeframes, unpredictable fire behavior, and firefighter and public safety – mitigation measures specified by the archeologist will be implemented as part of the suppression response.

Required mitigation in all cases may include but is not limited to: relocation of firelines away from sensitive sites, line construction to exclude sites, removal of fuels from sensitive sites to reduce fire intensity, installation of hoselays, sprinklers or other water handling devices for direct protection of features, and/or wrapping sites or features with fire protective shelter material. As new cultural resource requirements and standards for protection are developed, they will be adopted and included as an appendix in this document.

Assessing the condition of known resources before project implementation and after the project is complete will provide better information on effects on cultural resources, and feedback on the effectiveness of mitigation practices. These pre/post project inspections are considered part of the project and may be funded from project dollars. More detailed cultural resource monitoring information is included in Appendix C of the *SEKI Fire and Fuels Management Plan*.

Wilderness

Approximately 90% of the monument is designated wilderness. By NPS policy, areas proposed for wilderness are managed exactly the same as designated wilderness.

NPS Management Policy 6.3.9 directs that:

“Fire management activities conducted in wilderness areas will conform to the basic purposes of wilderness. The parks’ fire management and wilderness plans must identify and reconcile the natural and historic roles of fire in the wilderness, and will provide a prescription for response, if any, to natural and human- caused wildfires. If a prescribed fire program is implemented, these plans will also include the prescriptions and procedures under which the program will be conducted within wilderness. Actions taken to suppress wildland fire will use the minimum requirement concept and will be conducted in such a way as to protect natural and cultural resources and to minimize the lasting impacts of the suppression actions.”

NPS Director’s Order 4I, Wilderness Preservation and Management (DO- 4I, Section 5) further states that “under ideal conditions, natural fire should be considered as a fundamental component of the wilderness environment.”

In conformity with direction in NPS Management Policy 6.3.9 and NPS Director’s Order 4I, the natural and historic role of fire in the parks’ wilderness has been assessed and documented. In summary, lightning ignited fires have been found to be a natural process and primary driver of natural plant communities throughout the monument’s wilderness. Native American fire use has also been documented, with the influence of such use in shaping vegetation communities largely unknown.

All fire management activity in wilderness will be conducted according to minimum impact suppression guidelines found in SEKI’s *Fire and Aviation Management Operations Guide* (Addendum). Delegations of authority to incoming fire management teams will require that minimum impact suppression techniques be followed (see delegation example in Appendix F).

The use of chainsaws, portable pumps, and the landing of helicopters, for all fire operations will be considered appropriate as the minimum tool, as will electronic devices including but not limited to global positioning units for mapping and locating fires, and cell phones and portable radios for communications.

When using helicopters, the monument will consider operational periods, amount of flight time, and sensitivity of travel routes. When using stock, the monument will adhere to existing regulations including party size restrictions and forage area regulations, and will consider the implications of competing for limited forage in relation to private and commercial stock users. Use of both stock and aircraft will be kept to the minimum necessary commensurate with meeting project objectives and providing for firefighter safety.

Burned area emergency rehabilitation plans may be implemented under the direction of a resource advisor following significant fire management actions. Emergency rehabilitation in wilderness will seek to restore areas impacted by fire operations in ways that will restore and preserve wilderness character and conditions. Actions implemented under emergency conditions as part of immediate suppression and stabilization generally do not require pre-approval. Proposals for long term recovery actions will be submitted to the SEKI Environmental Management Committee (EMC), which will recommend and enforce the appropriate level of environmental compliance prior to implementation.

Fire- related research and monitoring may occur to document and understand the effects of fire management actions in wilderness. Research and monitoring staff and equipment will create additional transient (short- term, infrequent) impacts. Any proposal that required the installation of long term or permanent research or monitoring equipment in the wilderness will require a separate analysis and approval by the SEKI Environmental Management Committee.

Soils

Prescriptions designed to reduce fire severity during prescribed fire operations will be followed. Existing roads and trails will be used to the greatest extent possible as control lines for both wildland and prescribed fires.

Tactics involving the use of handtools which minimize the impacts to soil will be employed to construct firelines, where appropriate. Fire management personnel will rehabilitate firelines after completing the operation to reduce soil loss through erosion.

Air Quality

Several methods are available to reduce the impacts to air quality including (1) minimizing the area burned, (2) reducing the fuel loading in the area to be burned through mechanical pretreatment, (3) reducing the amount of fuel consumed by fire through the use of smaller burn units, and (4) minimizing emissions per ton of fuel consumed by burning under favorable conditions or using different firing techniques.

Prescribed burns will not be conducted under conditions where ambient levels of ozone are already determined to be unhealthy. Prescriptive elements in prescribed burn plans will specify the proper conditions necessary to increase smoke dispersal and enhance burning, thereby reducing impacts from smoke.

Under the Clean Air Act, the monument is responsible for protecting air quality within its boundaries. The monument must also take appropriate action to do so, when reviewing emission sources both within and in proximity to the monument (Malkin 1994, Clean Air Act, as amended). Therefore, all prescribed burns will be conducted in accordance with regulations established by the State of California and the Clean Air Act and the Smoke Management Plan (Appendix C).

Water Quality

In addition to the measures identified in the soils section, whenever possible, vegetation adjacent to streams and other water courses will be protected. The vegetation should sufficiently slow the flow of any run-off to permit debris and soil to be deposited before it could reach a stream or river. Site specific mitigation measures will be included in prescribed burn plans when appropriate. Activities will be coordinated with neighboring landowners and agencies to avoid impacting a specific watershed.

All riparian areas, including wild and scenic rivers, will be protected from contamination by fire fighting foams and aerial retardant following guidelines in the *Fire and Aviation Management Operations Guide* (FAMOG). Minimum impact suppression techniques detailed in the FAMOG will be used in the monument and are especially critical to apply in wild and scenic river corridors. Chemical fire retardant will be used sparingly and with maximum regard for aquatic life. Retardant use will be highly discouraged near significant streams, especially the Middle Fork of the San Joaquin River.

Aquatic resources

All riparian areas, including wild and scenic rivers, will be protected from contamination by fire fighting foams and aerial retardant following guidelines in the *Fire and Aviation Management Operations Guide* (FAMOG). Minimum Impact Suppression Techniques (MIST) detailed in the FAMOG will be used in the monument and are especially critical to apply in Wild and Scenic River corridors.

Vegetation

Prescribed burning has direct and indirect effects on the environment. Proper use of prescribed fire and evaluation of the benefits and costs of a burn require knowledge of the manner in which fire affects vegetation. Prescribed burns will be implemented with appropriate consideration given to the historical role of fire and the potential impacts of its reintroduction to a given biotic (or plant) community. The intensity and frequency of fire in a given plant community will be controlled to meet resource objectives. Prescribed burns will be timed to achieve maximum benefits to a target species or biotic community and minimize adverse environmental effects.

Wildlife

Care will be taken to avoid burning during sensitive periods, for example, prior to fledging of ground nesting birds. Additional protection will be afforded to sensitive species (see Special Status Species).

Special Status Species

Known locations of sensitive species will be considered during wildland fire suppression operations unless it is known that fire enhances a particular species. All known listed species in a burn unit will be evaluated prior to a prescribed burn and protected as specified in the

prescribed burn plan. All such measures will be identified in prescribed burn plans and in a site-specific, pre- attack wildland fire suppression plan.

Invasive Non-native Plants

There is a risk that prescribed fire will cause the establishment and spread of invasive plants. The risk can be minimized by managing the location and timing of fires and the presence of seed sources. Because bull thistle is more widespread in the monument, absolute avoidance may not be possible. However, planned fire locations will be compared with known bull thistle locations so that pre- and post- fire invasive plant control could be administered to affected burn units. The risk that the close proximity of stock to a prescribed burn unit will provide a source of non-native plant seed will be minimized by the use of California certified weed- free feed by the Reds Meadow Pack Station. Region 5 of the U.S. Forest Service, which includes Inyo National Forest, is in the process of drawing up regulations to require use of California certified weed- free feed by all users and pack stations (Nelson 2003).

Scenery and Recreation

When, during wildland fire suppression operations and prescribed fire operations, administrative closure of an area is necessary to provide for visitor protection, all affected trailheads will be signed so that closures will be easily recognized. Safety measures to ensure visitor safety include posting traffic warning signs and public notices and will be identified in the prescribed burn plan. Interpretative programs will be presented, when appropriate, to better inform the public of the role of fire in the ecosystem and explain the ways in which fire can be used to accomplish management objectives. The monument will work with adjacent landowners and the Forest Service to coordinate activities so that the visiting public will be impacted as little as possible.

Gateway Communities

Interpretative programs will be presented, when appropriate, to better inform the public of the role of fire in the ecosystem and the ways in which fire can be used to accomplish management objectives. The monument will work with the Forest Service to coordinate activities so that the gateway communities will be impacted as little as possible.

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